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February 4, 2010

Ms. Beth Walden
Remedial Project Manager
United States Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-8960

Re: Vegetation Sampling Work Plan
Olin Chemicals/McIntosh Plant Site, Operable Unit 2
McIntosh, Alabama

Dear Ms. Walden,

Enclosed please find four copies of the *Vegetation Sampling Work Plan, Operable Unit (OU)-2, McIntosh, Alabama.* This document has also been provided electronically via e-mail.

This work plan was prepared to characterize bioaccumulation into terrestrial and aquatic plant life for constituents of concern (COCs) at OU-2. The results of the vegetative sampling will be provided to USEPA in the updated ERA document which will use the bioaccumulation factors to quantify risk for site receptors.

Please let me know if you have any questions. I can be reached at (423) 336-4388 or via e-mail (kdroberts@olin.com).

Sincerely,

OLIN CORPORATION

Keith D Roberts

Keith D. Roberts
Manager, Environmental Sites

Enclosure

cc:	S.B. Favors – ADEM	C.E. Draper - MACTEC
	A.B. Carringer – Olin	T. B. Odom – Olin
	R.A. Kennedy – Olin	E. F. Curtis - MACTEC

Vegetation Sampling Work Plan

Operable Unit 2
McIntosh, Alabama

Prepared for:

Olin

OLIN CORPORATION

Prepared by:

MACTEC

MACTEC Engineering and Consulting, Inc.
3200 Town Point Drive NW, Suite 100
Kennesaw, Georgia 30144

February 4, 2010
Project 6107-10-0036

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ABBREVIATIONS AND ACRONYMS

AOC	Administrative Order of Consent
BAF	bioaccumulation factor
COCs	constituents of concern
DDTR	sum of 2, 4′- and 4, 4′- isomers of DDT, DDE, and DDD
DDD	2,2- and 2,4-dichlorodiphenyldichloroethane
DDE	2,2- and 2,4-dichlorodiphenyldichloroethylene
DDT	2,2- and 2,4-dichlorodiphenyltrichloroethane
DQO	data quality objectives
ERA	ecological risk assessment
ft^2	square foot
GPS	Global Positioning System
HCB	hexachlorobenzene
LCS	laboratory control samples
MACTEC	MACTEC Engineering and Consulting, Inc.
MS	matrix spike
MSD	matrix spike duplicate
NCP	National Contingency Plan
Olin	Olin Corporation
OU	Operable Unit
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RI/FS	remedial investigation/feasibility study
RPM	Remedial Project Manager
site	McIntosh, Washington County, Alabama, Plant Site
URS	URS Corporation
USEPA	United States Environmental Protection Agency
WCC	Woodward Clyde Consultants
Work Plan	*Vegetation Sampling Work Plan*

1.0 INTRODUCTION

Olin Corporation (Olin) has conducted a Remedial Investigation/Feasibility Study (RI/FS) at its McIntosh, Washington County, Alabama, Plant Site (site) under the oversight of the United States Environmental Protection Agency (USEPA). Olin signed an Administrative Order of Consent (AOC), effective May 9, 1990, to satisfy the National Contingency Plan (NCP; 40 Code of Federal Regulations 300). The site is an active chemical production facility, located approximately 1-mile east-southeast of the town of McIntosh, Washington County, Alabama. The site is listed on the National Priority List of the Comprehensive Environmental Response, Compensation, and Liability Act and is composed of two operable units (OUs): OU-1, which consists of the manufacturing process area of the site, and OU-2, which consists mostly of wetlands adjacent to the Tombigbee River.

Numerous studies have been conducted at the site. Reports on these studies include an RI report (Woodward-Clyde Consultants [WCC], 1993a), FS report (WCC, 1993b), additional ecological studies to supplement the RI (WCC, 1994a,b), an Ecological Risk Assessment report (ERA) (WCC, 1995), a second FS report (WCC, 1996), OU-2 Remedial Goal Option Support Sampling Report (URS Corporation [URS], 2002), and the Enhanced Sedimentation Pilot Project Baseline Sampling Report (MACTEC Engineering and Consulting, Inc. [MACTEC], 2007). The FS and implementation of the remedial action have been completed for OU-1 and are being monitored under the Resource Conservation and Recovery Act program. Work at OU-2 is ongoing.

Previous OU-2 studies, as listed above, focused on surface water, floodplain soils, sediment, and biota. The focus of this *Vegetation Sampling Work Plan* (Work Plan) is the characterization of terrestrial and aquatic plant life at OU-2. This Work Plan is being prepared to fulfill the USEPA's recommendation to analyze vegetation for constituents of concern (COCs) at OU-2. The main COCs in sediment and vegetation are mercury and methylmercury. Other COCs include DDTR (2,2- and 2,4-dichlorodiphenyl-trichloroethane [DDT], 2,2- and 2,4-dichlorodiphenyldichloroethylene [DDE], and 2,2- and 2,4-dichloro-diphenyldichloroethane [DDD] residues) and hexachlorobenzene (HCB). This Work Plan is prepared in accordance with the AOC between USEPA and Olin.

1.1 PURPOSE AND OBJECTIVES

The purpose of the vegetative sampling is to provide data to evaluate the uptake of COCs in terrestrial and aquatic plants at OU-2. The resulting data will be used to identify OU-2 specific inputs in an updated ERA. The sampling rationale, methods, resulting data, and how the data will be used are described in this Work Plan. Data Quality Objectives (DQOs) are discussed in Section 2.0. The results of the vegetative sampling will be provided to the USEPA in the updated ERA document.

2.0 DATA QUALITY OBJECTIVES

The USEPA has a Quality System for data and technology to manage the quality of environmental data collection, generation, and use. The primary goal of the USEPA Quality System is to ensure that environmental data are of sufficient quantity and quality to support the data's intended use. The USEPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* provides guidance to planning teams to develop performance and acceptance criteria or DQOs that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions (USEPA, 2006).

The DQOs are best defined during the planning stages so that collection of appropriate data, decontamination, containerization, shipping, and analytical methods are consistent with the degree of confidence required of the resultant data (USEPA, 2006).

The DQO process is a seven-step iterative planning approach used to prepare plans for environmental data collection activities. The seven steps are listed below.

1. State the problem
2. Identify the goal of the study
3. Identify information inputs
4. Define the boundaries of the study
5. Develop the analytical approach
6. Specify performance or acceptance criteria
7. Develop the plan for obtaining data

The format for describing these seven steps is based on the format and wording presented in the USEPA guidance document.

Step 1 – State the Problem

Mercury, methylmercury, HCB, and DDTR in soil and sediment within the Basin and Round Pond may be bioaccumulated by vegetation at OU-2. Assessment activities indicate that mercury, methylmercury, HCB, and DDTR are detected in media. Site-specific vegetation data are not available. Without site-specific vegetation data, site-specific bioaccumulation factors (BAFs) for mercury, methylmercury, HCB, and DDTR for soil and sediment to terrestrial and aquatic vegetation cannot be calculated.

Project/Planning Team – The project/planning team consists of Olin and their contractor, MACTEC. The USEPA's oversight team consists of the remedial project manager (RPM) and USEPA's consultants. A project organizational chart is provided as Figure 1-1 in the Quality Assurance Project Plan (QAPP) for Operable Unit 2 (MACTEC, 2008). The field project lead will be a MACTEC qualified field biologist.

Resources/Schedule – Sufficient resources will be committed to perform the scope of work described in Section 3.0 in 2010 when the water elevation returns to 6 feet North American Vertical Datum 88 and applicable vegetation is available.

Step 2 – Identify the Goal of the Study

Principal Study Questions –

- What are concentrations of mercury and other COCs in soil, sediment, and terrestrial and aquatic vegetation?
- What are site-specific BAFs from soil to terrestrial vegetation for mercury and other COCs?
- What are site-specific BAFs from sediment to aquatic vegetation for mercury and other COCs?

Alternative Actions – If soil, sediment, and terrestrial and aquatic vegetation samples cannot be collected and laboratory-analyzed to calculate BAFs, then existing BAFs from the literature will be used in the ERA for OU-2.

Decision Statement – If soil, sediment, and terrestrial and aquatic vegetation samples can be collected and laboratory-analyzed, then these site-specific field data will be used to calculate BAFs for use in the ERA for OU-2. If site-specific data are not obtained, then existing BAFs from the literature will be used in the ERA for OU-2.

Step 3 – Identify Information Inputs

Type of Information Needed – Data to be collected during this study include the following:

- Soil and sediment samples from OU-2 to be analyzed for mercury and other COCs
- Aquatic vegetation samples from locations collocated with sediment samples to analyze for mercury and other COCs

- Terrestrial vegetation samples from locations where floodplain soil sampling locations to analyze terrestrial vegetation samples for mercury and other COCs

Source of Required Information – Concentrations of COCs in soil and sediment from previous sampling efforts were used to select locations for sampling soils and vegetation. The floodplain soil sampling plan was provided to the USEPA on July 29, 2009, with a revised floodplain soil sampling map provided on September 18, 2009. Terrestrial vegetation samples will be collocated with these floodplain soil samples. Field notes from previous visits were used to identify areas of aquatic vegetation and select appropriate locations for sampling sediment and aquatic vegetation. Locations selected should be representative of the range of concentrations of COCs at OU-2.

Analytical Methods to Provide the Necessary Data – The analytical and physical testing methods to obtain the information required are described in Section 3.0 of this Work Plan.

Step 4 – Define the Boundaries of the Study

The scope of work presented herein is intended to optimize the locations of monitoring points to adequately represent soil, sediment, and vegetation COC concentrations at OU-2 between the Tombigbee River and the bluff immediately east of the Basin. The vegetation investigation is planned for 2010 when water levels are at appropriate levels and terrestrial and aquatic vegetation are present.

Step 5 – Develop the Analytical Approach

Sample Concentrations Exceeding Detection Limits – The environmental sampling is designed to represent a range of possible concentrations of soil, sediment, and terrestrial and aquatic vegetation concentrations, include sufficient replicates, and incorporate quality assurance/quality control (QA/QC) so that environmentally significant effects can be qualified. If samples are below detection limits, one-half the detection limit will be used as the concentration for that sample.

BAF Development – Upon receipt of the laboratory analytical data and validation, soil and terrestrial vegetation and sediment and aquatic vegetation data will be paired by location to calculate the BAF. The resultant BAFs will be used in the ERA to evaluate risk for ecological receptors when appropriate for that ecological receptor.

Step 6 – Specify Performance of Acceptance Criteria

Duplicate, matrix spike/matrix spike duplicate (MS/MSD), and equipment rinsate samples will be used to evaluate the effectiveness of laboratory methods and the sample collection methods used by the field crew. The goal is to obtain 95 percent completeness of the data.

Step 7 – Develop the Plan for Obtaining the Data

The sampling design incorporates terrestrial and aquatic vegetation to represent the two types of vegetation present within the berm to obtain representative BAFs for soil and sediment to vegetation for the ERA. The sampling design is based on the locations of floodplain soil samples and presence of aquatic vegetation. Concentrations of COCs in floodplain sediment and soil from previous sampling efforts were used to select locations for sampling vegetation. The DDTR source was from the north and migrated to the south over time. HCB was discharged from the discharge ditch in the southwest portion of OU-2 and was detected in the southern portion of the Basin. Sample locations for DDTR are generally concentrated in the north and extend to the south. HCB sample locations are generally located in the southern portion of OU-2. Selected sampling locations should be representative of the gradient of COC concentrations in floodplain soils. Field notes from previous visits were used to identify areas of aquatic vegetation and select appropriate locations for sampling sediment and aquatic vegetation. Aquatic vegetation grows in a limited number of areas. Aquatic vegetation sample locations were distributed across OU-2 to encompass the gradient of COC concentrations in sediment and aquatic vegetation. This assessment will include analysis for mercury, methylmercury, HCB, and DDTR.

Data Quality Indicators

This section defines the indicators that will be used to quantify data quality. These indicators include method detection limits, practical quantitation limits, precision, accuracy, completeness, representativeness, and comparability. The DQOs, which are based on project requirements, indicate that the data generated during the project will be of a known quality, and that the quality is acceptable to achieve the project's technical objectives.

Reporting Detection Limit

The reporting detection limits routinely achievable by a chemical analytical laboratory for the analyses are listed in Tables 3-4 and 3-5. The reporting limit represents a measurement that the laboratory can report with confidence.

Precision

Precision is an assessment of the variability of measurements under a given set of identical conditions. In environmental sampling, precision is the result of field sampling and analytical factors. Precision in the laboratory is easier to measure and control than precision in the field. Replicate laboratory analyses of the same sample provide information on analytical precision; replicate field samples provide data on overall measurement precision. The difference between the overall measurement precision and the analytical precision is attributed to sampling precision.

Laboratory analytical precision will be estimated by analyzing samples in duplicate: either the unspiked sample and its duplicate(s) or the MS/MSD samples. Variability will be expressed in terms of relative percent difference; 35 percent or less difference is considered acceptable for sediment; 150 percent or less difference is considered acceptable for vegetation due to natural waxes present in vegetative tissues based on discussions with analytical laboratories.

Accuracy

Accuracy is an assessment of how closely the measured value approximates the true value. The complete train of events involved in the measurement system, from sampling to analysis, affects the accuracy of the data generated.

Laboratory accuracy will be determined by using standard reference materials of known and traceable purity and quality, system monitoring compounds, compound spikes, matrix spike samples, and duplicate laboratory control samples (LCS). A comprehensive QAPP has been developed for OU-2 (MACTEC, 2008). This document provides the laboratory-specific QA/QC procedures to be used in the analytical testing, including a check for system accuracy in the absence of matrix effects. This will be accomplished by the preparation and analysis of spike method blanks or LCS. Accuracy will be expressed as a percentage of the true value [(X-T)100/T], where X = reported value and T = true value. Acceptable recovery will be those associated with the analytical method and specified laboratory.

For field analytical measurements, equipment and instruments will be calibrated in accordance with operation manuals.

Representativeness

Representativeness is a measure of how closely the data collected portray the conditions of the site under investigation. The sampling plan and sampling procedures to be used are discussed in Section 3.0.

Comparability

Comparability is a qualitative parameter expressing confidence that one set of data can be compared. Standardized sampling and analytical procedures will be used so that the reported data can be used in comparison with future investigations.

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was anticipated. The goal for completeness is 95 percent of the data.

3.0 SAMPLING AND ANALYSIS PROCEDURES

Two types of vegetative plants (aquatic vegetation [plants adapted to growing partially or entirely in water] and terrestrial vegetation [plants adapted to growing on upland soils]) will be sampled. Aquatic plants (these include emergent aquatic plants) will be sampled at a maximum of 10 locations depending upon occurrence and access. Approximate sample locations are shown on Figure 3-1. Each aquatic sample will be collocated with a corresponding sediment sample (Table 3-1). Terrestrial plants will be sampled at 10 locations as depicted on Figure 3-1. Terrestrial plant samples will be collocated with corresponding floodplain soil samples (Table 3-2). A summary of the sample media, number of samples, and QA/QC samples are provided in Table 3-3. The sample parameters, analytical methods, and preservation are summarized in Tables 3-4 and 3-5.

3.1 ANALYTICAL PARAMETERS

Samples will be analyzed for the following parameters:

- Mercury
- Methylmercury
- Hexachlorobenzene
- DDTR – Sum of 2,2′- and 2,4′- isomers of DDT, DDE, and DDD

Samples will be placed in coolers on ice (wet or dry) and shipped overnight under chain-of-custody procedures to the analytical laboratory in accordance with the QAPP (MACTEC, 2008). Custody seals will be employed during sample shipment. Field activities, measurements, and observations will be recorded in indelible ink in a bound field logbook. Field procedures will be conducted in accordance with the QAPP (MACTEC, 2008).

3.2 AQUATIC VEGETATION SAMPLING PROCEDURES

Aquatic plant samples will be collected prior to sediment samples to minimize cross-contamination of media. Sampling equipment will be decontaminated in accordance with the procedures specified in Section 3.6 prior to collection of the sample. Sampling equipment, when not in use, will be wrapped with aluminum foil and placed on clean polyethylene sheeting or in a protected area. Sampling locations will be recorded using a hand-held Garmin® Global Positioning System (GPS) unit.

A quadrat location will be selected to provide a consistent mixture of representative aquatic vegetation at the sample locations. If water depths do not allow samples to be taken at the position designated, aquatic vegetation samples will be collected where available, but as close as possible to the original sampling location. Each vegetation sampling location will be a 2-ft^2 quadrat. Vegetation stalks will be clipped using stainless steel professional kitchen and herb scissors as close to the substrate as possible without disturbing the sediment in each quadrat. Care will be taken to not disturb underlying sediment at the sampling location. One aquatic vegetation sample will be collected at each aquatic vegetation sampling location for a maximum of 10 aquatic vegetation samples. One field duplicate and one MS/MSD sample will also be collected. The samples will be placed in coolers on ice and shipped overnight under chain-of-custody procedures to the analytical laboratory. Concentrations will be reported on a wet and dry basis.

3.3 SEDIMENT SAMPLE COLLECTION PROCEDURES

A surficial sediment sample will be collocated with the aquatic vegetation sample location. Surficial sediment samples will be collected using an Ekman dredge to collect the upper 4 inches of sediment. The discrete sediment samples will be homogenized and cleared of rocks and debris. A total of 10 sampling locations is planned for OU-2. Surficial sediment samples will be analyzed for the following constituents as indicated in Table 3-1:

- Mercury
- Methylmercury
- DDTR – sum of 2,2″- and 2,4′- isomers of DDT, DDE, and DDD
- Hexachlorobenzene

Sample analytical methods, preservation, holding times, and the number of samples collected are included in Table 3-4. One field duplicate and one MS/MSD sample will also be collected. The samples will be placed in coolers on ice and shipped overnight under chain-of-custody procedures to the analytical laboratory. Custody seals will be employed to check for tampering during shipment.

3.4 TERRESTRIAL VEGETATION SAMPLING PROCEDURES

Herbaceous terrestrial vegetation samples will be collected prior to the soil samples to minimize cross-contamination of media if both media are collected on the same day. Sampling equipment will be decontaminated in accordance with the procedures specified in Section 3.6 prior to collection of the samples. Sampling equipment, when not in use, will be wrapped with aluminum foil and placed on clean polyethylene sheeting or in a protected area. Sampling locations will be recorded using a hand-held Garmin® GPS unit.

A quadrat location will be selected that provides a consistent mixture of representative sample of ground vegetation found at each terrestrial sample location. Vegetation sampling locations will consist of a 2-ft^2 quadrat. Terrestrial vegetation samples will be collected by clipping vegetation stalks, using stainless steel professional kitchen and herb scissors, as close to the ground as possible without disturbing the soil. One field duplicate and one MS/MSD sample will be collected for analysis. Care will be taken to not disturb underlying soil.

3.5 VEGETATION SAMPLE HANDLING PROCEDURES

Clipped vegetation samples will be stored in new 1-gallon, resealable storage bags labeled with the appropriate sample ID. Samples will be kept on ice. Vegetation will be washed according to the procedures described below prior to shipment:

1. Don double nitrile gloves prior to washing samples.
2. Submerge vegetation in an ASTM Type II water bath. Gently rub large leaves or stems to remove soil/sediment, epiphytes, and other living organisms from the surface of the plant to eliminate possible cross contamination of the vegetation sample. Use caution to avoid damaging the sample.
3. After soaking and removing as much soil/sediment as possible by hand, rinse vegetation with ASTM Type II water and place on clean paper towels to absorb excess water. Assure that the paper towels do not come in contact with soil or other contaminants by covering the area with plastic or foil. Use new paper towels to dry off each sample.
4. Make a fresh bath for each sample using a clean, decontaminated container and unused ASTM Type II water between each sample.

Cleaned vegetation samples will be packed in aluminum foil and placed into new 1-gallon, resealable storage bags labeled with the appropriate sample ID. Samples will be preserved as listed in Table 3-5 and shipped via overnight carrier for analysis. Concentrations will be reported on a wet and dry basis. Chain-of-custody procedures will be followed as described in the QAPP (MACTEC, 2008).

3.6 DECONTAMINATION PROCEDURES

Equipment that will contact environmental samples will be decontaminated using the following procedure.

1. Rinse with ASTM Type II water
2. Liquinox scrub
3. Rinse with ASTM Type II water
4. Rinse with 5 percent nitric acid solution
5. Rinse with ASTM Type II water
6. Air dry

A rinsate blank will be collected during sampling of ASTM Type II water as it is poured over the sampling equipment after decontamination and collected in a rinsate blank sample container. Decontaminated equipment will be wrapped in aluminum foil until sample collection.

3.7 SAMPLE IDENTIFICATION

Samples collected during this effort will be labeled in accordance with the QAPP (MACTEC, 2008). The following information will be recorded.

- Site name
- Sampling location
- Names of sampling personnel
- Date and time of sample collection
- Unique sample identification number

Unique sample identification numbers were formulated and are presented in Tables 3-1 and 3-2 with the sample location and date as shown in the following example, with the last six digits being MMDDYY:

BAVS-1-061510

Specific instructions for sample IDs and an example are provided in Section 2.2.5 of the QAPP (MACTEC, 2008).

4.0 REFERENCES

MACTEC Engineering and Consulting, Inc. 2007. Enhanced Sedimentation Pilot Project (ESPP), Olin Chemicals, McIntosh Plant Site, McIntosh, Alabama. Prepared for Olin Corporation, Charleston, Tennessee. June 8, 2007.

MACTEC Engineering and Consulting, Inc. 2008. Quality Assurance Project Plan, Olin Corporation, Operable Unit 2, McIntosh, Alabama. Prepared for Olin Corporation, Charleston, Tennessee. October 9, 2008.

URS Corporation 2002. OU-2 RGO Support Sampling Report, McIntosh Plant Site, Olin Corporation, McIntosh, Alabama. April 2002.

USEPA, 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process. United States Environmental Protection Agency.

Woodward-Clyde Consultants. 1993a. Remedial Investigation Report, Olin Chemicals, McIntosh Plant Site, McIntosh, Alabama. Prepared for Olin Corporation, Charleston, Tennessee. February 1993.

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Woodward-Clyde Consultants. 1995. Ecological Risk Assessment of Operable Unit 2. McIntosh Plant Site, Olin Corporation, McIntosh, Alabama. May 1995.

Woodward-Clyde Consultants. 1996. Feasibility Study Operable Unit 2, McIntosh Plant Site, Olin Corporation, McIntosh, Alabama. February 1996.

TABLES

TABLE 3-1

AQUATIC VEGETATION AND SEDIMENT SAMPLING SUMMARY
OLIN McINTOSH OU-2

Aquatic Vegetation Sample Location	Analytical Parameters
BAVS-1-MMDDYY	Hg, MeHg, DDTR
BAVS-2-MMDDYY	Hg, MeHg, DDTR
BAVS-3-MMDDYY	Hg, MeHg, HCB
BAVS-4-MMDDYY	Hg, MeHg, HCB
BAVS-5-MMDDYY	Hg, MeHg, DDTR
BAVS-6-MMDDYY	Hg, MeHg, HCB
BAVS-7-MMDDYY	Hg, MeHg, DDTR
BAVS-8-MMDDYY	Hg, MeHg, HCB
BAVS-9-MMDDYY	Hg, MeHg, DDTR
BAVS-10-MMDDYY	Hg, MeHg, HCB

Notes:
Prepared/Date: EJS 01/04/10
Checked/Date: NSR 01/04/10
DDTR – Sum of 2,2′- and 2,4′- isomers of DDT, DDE, and DDD
HCB – Hexachlorobenzene
Hg – Mercury
MeHg – Methylmercury
MMDDYY – Month, Day, Year

TABLE 3-2

TERRESTRIAL VEGETATION SAMPLING SUMMARY
OLIN McINTOSH OU-2

Terrestrial Vegetation Sample Location	Analytical Parameters
FPVSS-1-MMDDYY	Hg, MeHg, DDTR
FPVSB-1-MMDDYY	Hg, MeHg, DDTR
FPVSS-4-MMDDYY	Hg, MeHg, DDTR
FPVSB-3-MMDDYY	Hg, MeHg, DDTR
FPVSS-9-MMDDYY	Hg, MeHg, HCB
FPVSB-4-MMDDYY	Hg, MeHg, DDTR
FPVSS-11-MMDDYY	Hg, MeHg, HCB
FPVSS-12-MMDDYY	Hg, MeHg, HCB
FPVSB-5-MMDDYY	Hg, MeHg, HCB
FPVSS-14-MMDDYY	Hg, MeHg, HCB

Notes:

Prepared/Date: EJS 01/04/10
Checked/Date: NSR 01/04/10

DDTR – Sum of 2,2′- and 2,4′- isomers of DDT, DDE, and DDD
HCB – Hexachlorobenzene
Hg – Mercury
MeHg – Methylmercury
MMDDYY – Month, Day, Year

TABLE 3-3

QA/QC SAMPLE SUMMARY
OLIN McINTOSH OU-2

Sample Media	Maximum Number of Samples	Duplicate	MS/MSD	Equipment Blanks	Total Number of Samples
Sediment	10	1	2	1	14
Aquatic Vegetation	10	1	2	0	13
Terrestrial Vegetation	10	1	2	1	14

Prepared/Date: EJS 01/04/10
Checked/Date: NSR 01/04/10

TABLE 3-4

SEDIMENT ANALYTICAL METHODS SUMMARY
OLIN McINTOSH OU-2

Sediment Analysis	Analytical Method	Container	Preservation	Reporting Limit	Method Detection Limit	Holding Time	Number of Samples
Methylmercury[1]	Bloom 1989, EPA 1630 draft	8 oz. Glass Jar	Dry Ice	0.05 ng/g	0.02 ng/g	None established	14
Mercury	EPA SW7471A	4 oz. Glass Jar	Wet Ice	0.1 mg/kg	0.00169 mg/kg	28 days	14
HCB	EPA 3550B/8270C	8 oz Glass Jar	Wet Ice	1.667 µg/kg	1.38 µg/kg	14 days until extraction and analyze within 40 days after extraction	9
DDTR	EPA 3550B/8081A	8 oz. Glass Jar	Wet Ice			14 days until extraction and analyze within 40 days after extraction	9
2,4'-DDD				1.667 µg/kg	0.591 µg/kg		
2,4'-DDE				1.667 µg/kg	0.592 µg/kg		
2,4'-DDT				1.667 µg/kg	0.576 µg/kg		
4,4'-DDD				3.333 µg/kg	1.51 µg/kg		
4,4'-DDE				3.333 µg/kg	0.99 µg/kg		
4,4'-DDT				3.333 µg/kg	1.53 µg/kg		

Notes:
[1] For methylmercury analysis, only fill sample containers one-half full as containers will be frozen.
ng/g – nanogram per gram
mg/kg- milligrams per kilogram
µg/kg – micrograms per kilogram

Prepared/Date: EJS 01/04/10
Checked/Date: NSR 01/04/10

TABLE 3-5

VEGETATION ANALYTICAL METHODS SUMMARY
OLIN McINTOSH OU-2

Vegetation Analysis	Analytical Method	Container	Sample Weight (g)	Preservation	Reporting Limit	Method Detection Limit	Holding Time	Number of Samples	Minimum Weight of Samples (g)
Methylmercury	Bloom 1989, EPA 1630 draft	Double ResealableBag	5	Wet Ice	5 ng/g	1 ng/g[1]	1 year[2]	28	5
Mercury	EPA 7471A	Double ResealableBag	5	Wet Ice	0.01 mg/kg	0.00144 mg/kg	6 months[3]	28	5
HCB	EPA 8081A	Double ResealableBag	50	Wet Ice	2.5 µg/kg[4]	0.46 µg/kg[4]	6 months[3]	18	55
DDTR	EPA 8081A	Double ResealableBag	50	Wet Ice			6 months[3]	18	55
2,4'-DDD					2.5 µg/kg[4]	0.7842 µg/kg[4]			
2,4'-DDE					2.5 µg/kg[4]	0.6694 µg/kg[4]			
2,4'-DDT					2.5 µg/kg[4]	0.4798 µg/kg[4]			
4,4'-DDD					5 µg/kg[4]	1.0443 µg/kg[4]			
4,4'-DDE					5 µg/kg[4]	1.6113 µg/kg[4]			
4,4'-DDT					5 µg/kg[4]	0.7959 µg/kg[4]			

[1] Waxy substances in vegetation may cause interferences resulting in sample dilution.
[2] For freeze dried samples.
[3] Frozen biota.
[4] Laboratory reporting limits and method detection limits are estimates.
g - grams
ng/g – nanogram per gram
mg/kg- milligrams per kilogram
µg/kg – micrograms per kilogram

Prepared/Date: EJS 01/04/10
Checked/Date: NSR 01/04/10

FIGURE

U.S. EPA REGION IV

SDMS

Unscannable Material Target Sheet

DocID: 10847056 Site ID: ALD008188708

Site Name: Olin Corp

Nature of Material:

Map:	☐	Computer Disks:	☐
Photos:	☐	CD-ROM:	☐
Blueprints:	☐	Oversized Report:	☐
Slides:	☐	Log Book:	☐

Other (describe): Proposed Vegetation Sampling Locations

Amount of material:

* Please contact the appropriate Records Center to view the material *